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sITE pROVISIONING Engine

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Provisioning Engine Script

A Comprehensive Guide

# Introduction

Provisioning engine scripts are essential tools in modern IT environments, enabling the automation of complex deployment and configuration tasks across multiple projects. These scripts help ensure consistency, reduce human error, and save time when it comes to rapid provisioning of SharePoint Site collections . In this guide, we will explore the key components of a provisioning engine script, its reusable nature, and the steps to execute PowerShell scripts, along with their advantages and usability.

This document will also cover the scope of creating SharePoint site collections with hub site architecture which are highly useful for Market/Department/Verticals specific SharePoint portals.

Before executing PnP (Patterns and Practices) commands to provision a site collection, certain prerequisites must be met.

# Prerequisites for Executing PnP Commands

* **Install the PnP PowerShell module**: Ensure that you have the PnP PowerShell module installed on your machine. This can be done via the PowerShell Gallery with the command: Install-Module -Name PnP.PowerShell.
* **Administrator Permissions**: You must have the appropriate administrative permissions to execute provisioning commands and to create or configure site collections in your SharePoint environment.
* **SharePoint Online Management Shell**: For SharePoint Online, ensure that the SharePoint Online Management Shell is installed and that you have the necessary credentials to connect to your tenant.
* **Authentication**: Proper authentication is required, typically using an account with permissions to perform provisioning tasks. You may use credentials or certificate-based authentication for this purpose.
* **Connectivity**: Ensure a stable internet connection if you are working with SharePoint Online to avoid any interruptions during the provisioning process.

Once these prerequisites are in place, you can proceed with executing PnP commands to provision site collections, enabling streamlined and efficient deployment of your SharePoint resources.

# Authentication Mechanism Options for SharePoint Script Execution

Below section will guide to establish connection with SharePoint before executing the script.

Username and Password

- Using the `Get-Credential` cmdlet, you can prompt for and use a username and password to authenticate.

- Example:

```powershell

Connect-PnPOnline -Url "[URL]" -Credentials (Get-Credential)

```

## App-Only Authentication

- This method uses a client ID and client secret to authenticate without a user context. It's useful for background services or daemon applications.

- Example:

```powershell

$clientId = "Your-Client-Id"

$clientSecret = "Your-Client-Secret"

$tenantId = "Your-Tenant-Id"

$url = "[URL]"

Connect-PnPOnline -Url $url -AppId $clientId -AppSecret $clientSecret -Tenant $tenantId

```

## Certificate-Based Authentication

- This method utilizes a certificate to authenticate. It is considered more secure and is suitable for automated scripts.

- Example:

```powershell

$certificatePath = "Path\To\Your\Certificate.pfx"

$certificatePassword = "Your-Certificate-Password"

$tenantId = "Your-Tenant-Id"

$clientId = "Your-Client-Id"

Connect-PnPOnline -Url "[URL]" -ClientId $clientId -TenantId $tenantId -CertificatePath $certificatePath -CertificatePassword (ConvertTo-SecureString -String $certificatePassword -AsPlainText -Force)

```

## Multi-Factor Authentication (MFA)

- For environments where MFA is required, you can use the `-UseWebLogin` parameter to authenticate via a web browser prompt.

- Example:

```powershell

Connect-PnPOnline -Url "[URL]" -UseWebLogin

```

Each of these authentication methods has its own use case and level of security. The choice of method will depend on your specific requirements and the security policies in place.

# Actions

Scope of this document is to help SharePoint administrator with admin right on SharePoint tenant with rapid provisioning of SharePoint Site Collection. And to apply site template for SharePoint site With immediate collaboration offering from SharePoint for its usage.

## Provision Hub Site

A hub site in SharePoint Online connects multiple sites, streamlining navigation, search, and content management while enabling consistent branding and structure across associated sites.

Attached script provisions and register site collection as a Hub Site. Additionally, scripts also add some property Bag values which are highly useful to persist and share useful information.

Script associated to this action is described in [below section](#_Create_a_Hub).

## Provision Associated sites

Associated sites in SharePoint enhance collaboration by linking multiple sites, enabling unified navigation, shared branding, and streamlined content management under a central hub site.

Similarly for Associated sites, site collection is provisioned, and association is performed. It also caters the feasibility to add property Bag values to site collection and create app catalog.

Script associated to this action is described in [below section](#_Create_an_Associated).

## Creating and Applying Site Templates

Once you have your SharePoint environment set up and the prerequisites met, the next step is to create and apply site templates over an existing site collection. This can be achieved using PnP PowerShell commands, which provide a powerful way to manage your SharePoint Online resources.

The PnP Provisioning Site Template XML schema allows you to define your site template in an XML format, specifying the desired configuration, features, and content.

To create a new site template with required features using the PnP Provisioning XML schema, follow these steps:

### Step 1: Define the XML Schema

Create an XML file that outlines the structure and configuration of your site template. Below link share numerous example of the XML schema with a required feature:  
 [https://github.com/pnp/PnP-Provisioning-Schema/tree/master/PnP.ProvisioningSchema](%20https:/github.com/pnp/PnP-Provisioning-Schema/tree/master/PnP.ProvisioningSchema)

### Step 2: Save the XML Schema

Save the XML schema to a file, for example, `siteTemplate.xml`.

### Step 3: Apply the Site Template Using PnP PowerShell

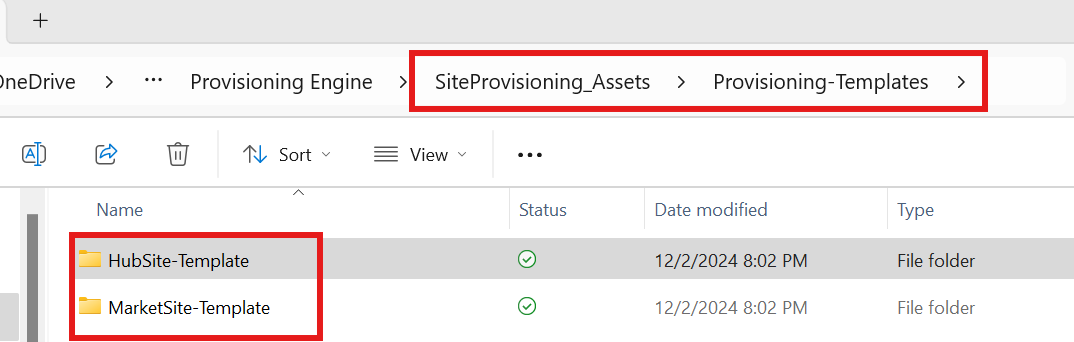
Use PnP PowerShell commands to apply the site template to a site collection. Below is a sample PowerShell script to accomplish this:

# Connect to SharePoint Online

**Connect-PnPOnline -Url "[URL]" -Credentials (Get-Credential)**

# Apply the provisioning template

**Apply-PnPProvisioningTemplate -Path "C:\path\to\siteTemplate.xml"***Below snapshot indicates the folder containing site templates for site collections in context of this document.*



# Scripts

Below section will explain about the scripts utilized for site provisioning. To serve with requirement to create a new site collection in SharePoint and register site as Hub site, creating an associated site, provisioning a Site collection with a custom Site Template, this guide could be proven as a reuseable asset.

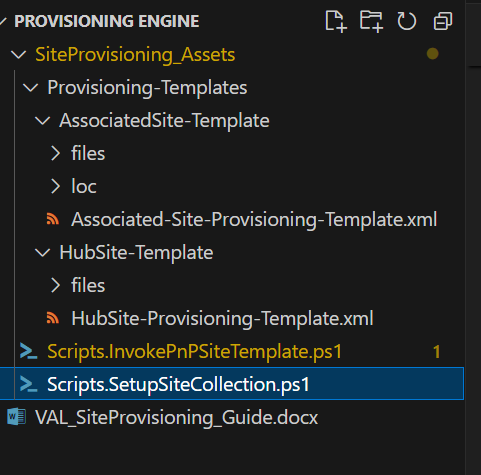
**NOTE**: Authentication can be achieved via various option before executing below scripts. This document is intentionally guiding and expecting login is already in place. For more information, please refer [section](#_Authentication_Mechanism_Options)

## Create a Hub Site Collection

1. Download the supporting assets first and follow the pre-requisite it requires to perform its operations.
2. Open PowerShell as an administrator and run the following command to install the PnP PowerShell module:

Install-Module -Name PnP.PowerShell

1. Navigate to Project folder and execute script file mentioned in below snapshot but providing required argumental values.

******

***This Scripts.SetupSiteCollection.ps1 is used to provision site collection and register it as a hub site. Based on parameters passed to script as argument it will provision site.***

***Parameters:***

|  |  |  |
| --- | --- | --- |
| **Param** | **Objective** | **Expected value** |
| ***DefaultLocaleId*** | Locale ID. Used to supply and provision site in specific language. | [***https://github.com/pnp/powershell/wiki/Supported-LCIDs-by-SharePoint***](https://github.com/pnp/powershell/wiki/Supported-LCIDs-by-SharePoint) |
| ***DefaultTimeZone*** | *TimeZone to be followed by the site* | [***https://pnp.github.io/pnpcore/api/PnP.Core.Admin.Model.SharePoint.TimeZone.html***](https://pnp.github.io/pnpcore/api/PnP.Core.Admin.Model.SharePoint.TimeZone.html) |
| ***HubSiteId*** | *Required when script is used to provision Associated site.* | ***Pass empty string “”*** |
| ***SiteTitle*** | *Title for your site* | ***<<Site title>>*** |
| ***SiteOwner*** | *Email address of user which will act as Site Collection Administrator for Site. And will be a part of Owners Group.* | ***<<***[***User1@abc.com***](mailto:User1@abc.com)***>>*** |
| ***Step*** | *Identifier to operate. Same script file is used for Associated sites. Hence step value will be different.* | ***1*** |
| ***TargetSite*** | *Absolute url for your site* | ***Sites/<<name of your site>>*** |
| ***Tenant*** | *Tenant name. ie.Domain name ony.* | **Eg :** [**www.abc.sharepoint.com**](http://www.abc.sharepoint.com) **abc : will be the domain name and expected to be passed to script.** |

1. Follow the output response and validate the site collection once execution is finished.
2. By this you will have a blank communication site collection in SharePoint tenant.

## Create an Associated Site

Same script file can be reused to provision an associated site in SharePoint tenant. To provision a Associated Site please follow below steps.

1. Download the supporting assets first and follow the pre-requisite it requires to perform its operations.
2. Identify GUID of the Hub Site as this will be required to associate the site with hub site. Use the URL ***https://<URL Of the Hub Site Collection>/\_api/site?$select=IsHubSite,*HubSiteId** to get the GUID of the Site Collection.
3. Open PowerShell as an administrator and run the following command to install the PnP PowerShell module: **(if modules are not installed on machine**)

Install-Module -Name PnP.PowerShell

1. Navigate to Project folder and execute script file mentioned in below snapshot but providing required argumental values.

***A screenshot of a computer

Description automatically generated***

***This Scripts.SetupSiteCollection.ps1 is used to provision site collection and responsible to associated the newly created site with its hub site. Based on parameters passed to script as argument it will provision site.***

***Parameters:***

|  |  |  |
| --- | --- | --- |
| **Param** | **Objective** | **Expected value** |
| ***DefaultLocaleId*** | Locale ID. Used to supply and provision site in specific language. | [***https://github.com/pnp/powershell/wiki/Supported-LCIDs-by-SharePoint***](https://github.com/pnp/powershell/wiki/Supported-LCIDs-by-SharePoint) |
| ***DefaultTimeZone*** | *TimeZone to be followed by the site* | [***https://pnp.github.io/pnpcore/api/PnP.Core.Admin.Model.SharePoint.TimeZone.html***](https://pnp.github.io/pnpcore/api/PnP.Core.Admin.Model.SharePoint.TimeZone.html) |
| ***HubSiteId*** | *Hub site id. It will be a guid value can be collected in step 2.* | ***xxxx-xxxxx-xxxxx-xxxx*** |
| ***SiteTitle*** | *Title for your site* | ***<<Site title>>*** |
| ***SiteOwner*** | *Email address of user which will act as Site Collection Administrator for Site. And will be a part of Owners Group.* | ***<<***[***User1@abc.com***](mailto:User1@abc.com)***>>*** |
| ***Step*** | *Identifier to operate. Same script file is used for Associated sites. Hence step value will be different.* | ***2*** |
| ***TargetSite*** | *Absolute url for your site* | ***Sites/<<name of your site>>*** |
| ***Tenant*** | *Tenant name. ie.Domain name of tenant.* | **Eg :** [**www.abc.sharepoint.com**](http://www.abc.sharepoint.com) **abc :** will be the domain name andexpected to be passed to script against this argument**.** |

1. Follow the output response and validate the site collection once execution is finished.
2. By this you will have a blank communication site collection in SharePoint tenant which is associated with its hub site.

## Apply Site Template to sites

A site template in SharePoint is an XML formatted file that defines the structure and layout of a site. It includes configurations for site features, pages, libraries, and lists. Applying a template ensures uniformity and streamlined deployment of new sites within the SharePoint tenant environment.

Provisioning sites with a site template offers several advantages:

1. **Consistency**: By using a site template, all sites within the SharePoint tenant environment will have a consistent structure and layout. This uniformity aids in navigation and usability across the organization, ensuring that users have a familiar interface regardless of which site they are using.

2. **Efficiency**: Deploying new sites using a template significantly reduces the time and effort required for setup. The predefined configurations streamline the creation process, allowing for quick and efficient rollouts of new sites, which is particularly beneficial in large-scale deployments.

Project folder contains basic xml file as site templates that will provision list, libraries, Permissions, Roles, Role definitions, SharePoint Groups, Apply permission to libraries , add footer, Menu bar etc.

Templates can be easily modified as per requirement by following its [MSDN article.](https://github.com/pnp/PnP-Provisioning-Schema/blob/master/PnP.ProvisioningSchema/ProvisioningSchema-2022-09.xsd)

### Apply template to hub site

Follow below steps to apply site template to hub site.

1. Download the supporting assets first and follow the pre-requisite it requires to perform its operations.
2. Navigate to Project folder and execute script file mentioned in below snapshot but providing required argumental values.

A screenshot of a computer

Description automatically generated

Inside **Provisioning- Templates** folder we are maintaining separate site template file under dedicated folders as Hubsite and Associated site to provide better understandings and segregation.

1. Execute **Scripts.InvokePnPSiteTemplate.ps1** to apply site templates on the hub site. Based on the argument values it will perform it operation and will create all mention SharePoint OOB artefacts(like colum, CT, list, library etc) in xml to the site.
2. Below table describe the arguments, its objective and expected value.
3. ***Parameters:***

|  |  |  |
| --- | --- | --- |
| **Param** | **Objective** | **Expected value** |
| ***TemplateFolderPath*** | Template folder path | [***HubSite-Template/***](https://github.com/pnp/powershell/wiki/Supported-LCIDs-by-SharePoint) |
| ***Handler*** | *Identifier to instruct PnPCommandlet to perform specific operation. For more details* [*refer.*](https://pnp.github.io/powershell/cmdlets/Invoke-PnPSiteTemplate.html#-handlers) | ***“All”*** |
| ***HubSiteId*** | *Hub site id. It will be a guid value can be collected in step 2.* | ***xxxx-xxxxx-xxxxx-xxxx*** |
| ***HubSiteURL*** | *Relative url for hus site* | ***Sites/<<hub Site>>*** |
| ***PrimaryEmailID*** | *Email address of user which will act as Site Collection Administrator for Site. And will be a part of Owners Group.* | ***<<***[***User1@abc.com***](mailto:User1@abc.com)***>>*** |
| ***Step*** | *Identifier to operate. Same script file is used for Associated sites as well. Hence step value will be different.* | ***1*** |
| ***TargetSite*** | *Absolute url for your site* | ***Sites/<<name of your site>>*** |
| ***Tenant*** | *Tenant name. ie.Domain name of tenant.* | **Eg :** [**www.abc.sharepoint.com**](http://www.abc.sharepoint.com) **abc :** will be the domain name andexpected to be passed to script against this argument**.** |

1. Script will pass some values at runtime to the xml file and will be used while applying the templates.
2. Once execution is completed, navigate to hub site and you will notice that all components mentioned in xml will be ready on the hub site.

### Apply template to Associated site

Follow below steps to apply site template to Associated site.

1. Download the supporting assets first and follow the pre-requisite it requires to perform its operations.
2. Navigate to Project folder and execute script file mentioned in below snapshot but providing required argumental values.

A screenshot of a computer

Description automatically generated

1. Execute **Scripts.InvokePnPSiteTemplate.ps1** to apply site templates on the hub site. Based on the argument values it will perform it operation and will create all mention SharePoint OOB artefacts (like column, CT, list, library etc.) in xml to the site.
2. Below table describe the arguments, its objective and expected value.
3. ***Parameters:***

|  |  |  |
| --- | --- | --- |
| **Param** | **Objective** | **Expected value** |
| ***TemplateFolderPath*** | Template folder path | [AssociatedSite***-Template/***](https://github.com/pnp/powershell/wiki/Supported-LCIDs-by-SharePoint) |
| ***Handler*** | *Identifier to instruct PnPCommandlet to perform specific operation. For more details* [*refer.*](https://pnp.github.io/powershell/cmdlets/Invoke-PnPSiteTemplate.html#-handlers) | ***“All”*** |
| ***HubSiteId*** | *Hub site id. It will be a guid value can be collected in step 2.* | ***xxxx-xxxxx-xxxxx-xxxx*** |
| ***HubSiteURL*** | *Relative url for hus site* | ***Sites/<<hub Site>>*** |
| ***PrimaryEmailID*** | *Email address of user which will act as Site Collection Administrator for Site. And will be a part of Owners Group.* | ***<<***[***User1@abc.com***](mailto:User1@abc.com)***>>*** |
| ***Step*** | *Identifier to operate. Same script file is used for Associated sites as well. Hence step value will be different.* | ***2*** |
| ***TargetSite*** | *Absolute url for your site* | ***Sites/<<name of your site>>*** |
| ***Tenant*** | *Tenant name. ie.Domain name of tenant.* | **Eg :** [**www.abc.sharepoint.com**](http://www.abc.sharepoint.com) **abc :** will be the domain name andexpected to be passed to script against this argument**.** |

1. Script will pass some values at runtime to the xml file and will be used while applying the templates.
2. Once execution is completed, navigate to hub site and you will notice that all components mentioned in xml will be ready on the Associated site.

In conclusion, once the script is executed, verify that all components specified in the XML file are correctly applied on the associated site by navigating to the hub site.

# Conclusion

This document outlines the methods for reusing assets to provision a SharePoint site collection (Communication site) as a hub site. Additionally, it demonstrates how these assets can be reused to create a SharePoint site collection as an associated site under a hub site.

We also discuss achieving uniformity across multiple site collections using site templates and applying these templates to both hub sites and associated sites. Furthermore, it provides guidance on creating SharePoint artifacts for existing sites by modifying site templates and subsequently applying those templates to the sites.